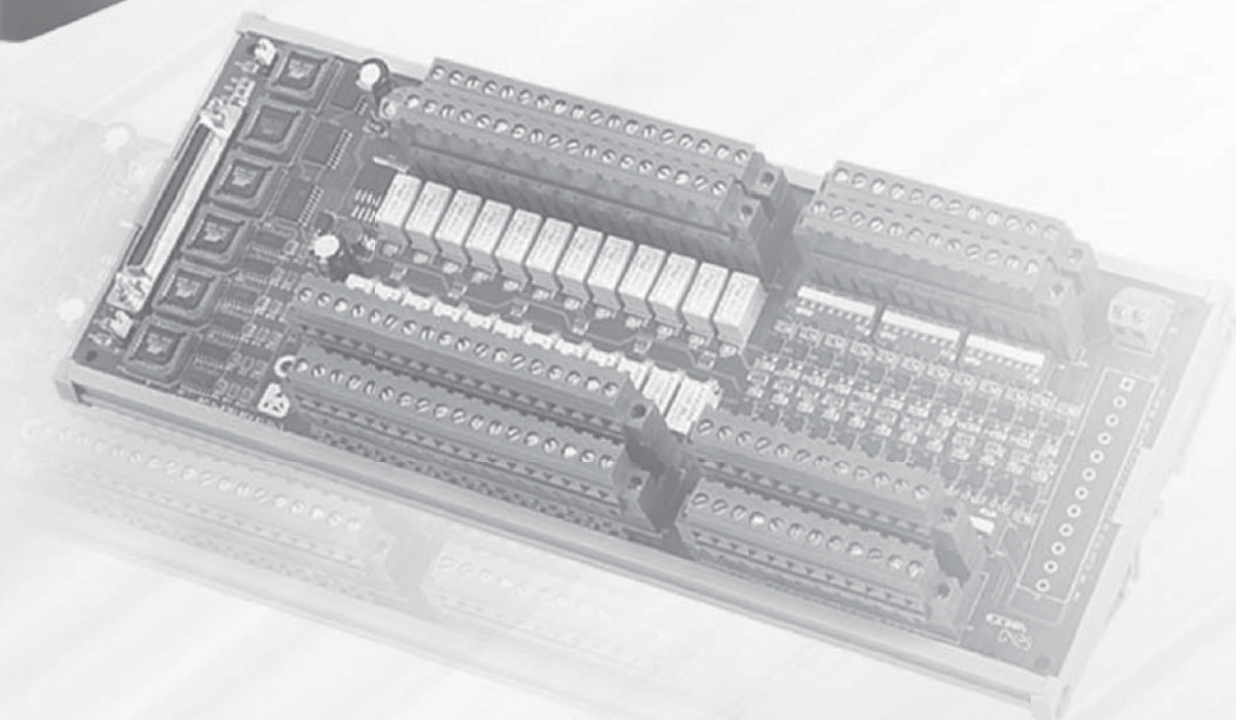


Signal Conditioning Modules and Terminal Boards



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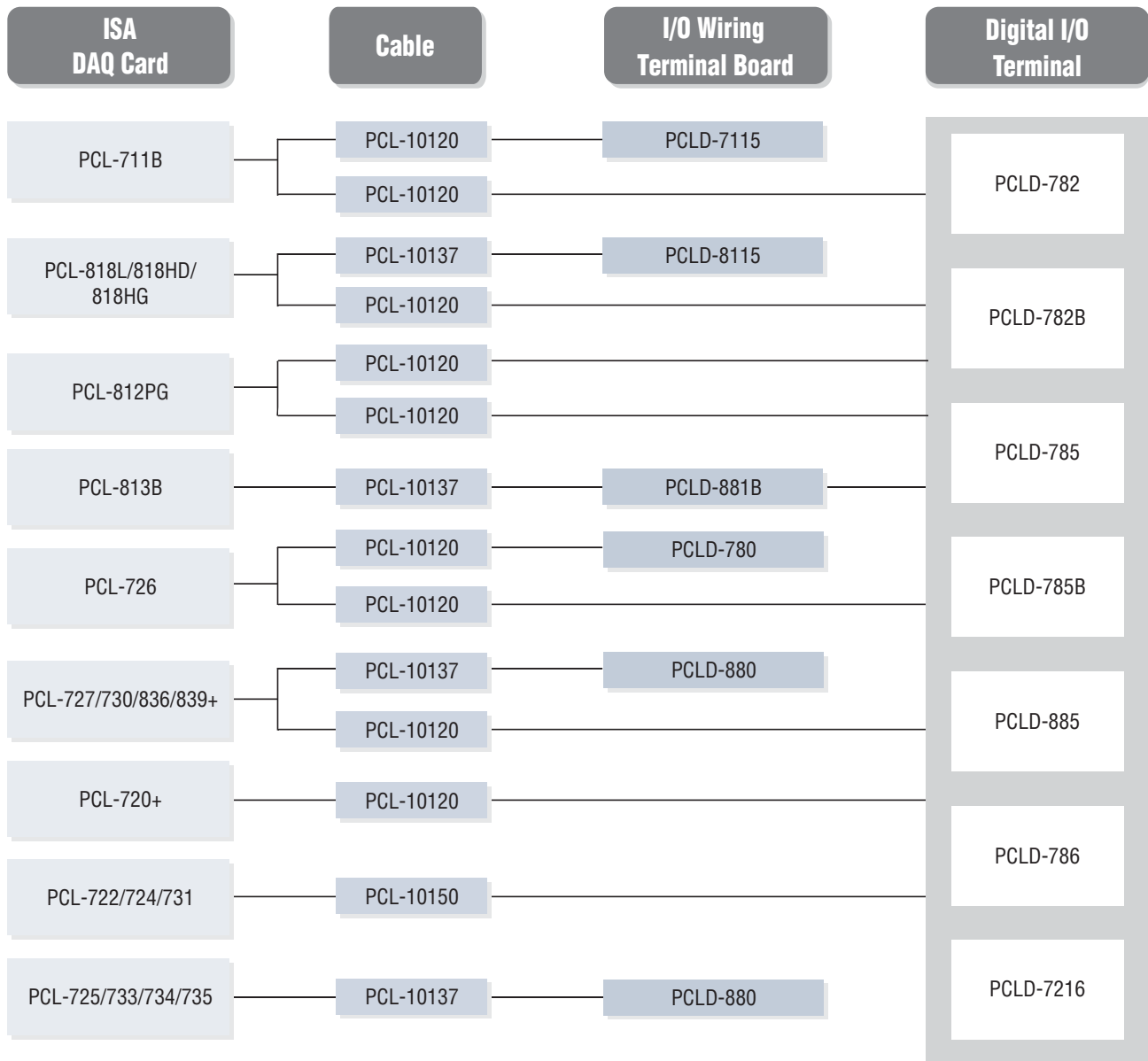


Terminal Board Selection Guide

Recommended Cables, I/O Wiring Terminal Boards and Isolated Digital I/O Terminals for Connecting to PCI Data Acquisition (DAQ) Cards

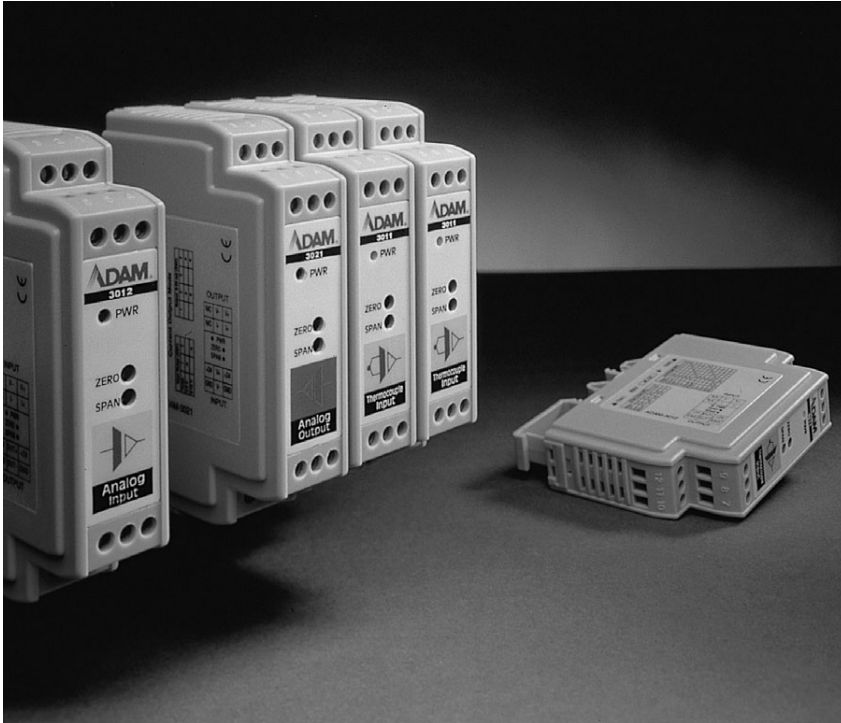
PCI DAQ Card	Cable	I/O Wiring Terminal Board	Cable	Digital I/O Terminal
PCI-1710U/1710UL/1710HGU/1710HGL/ 1711U/1711UL/1716/1716L/1741U/1742U	PCL-10168	PCLD-8710	PCL-10120	PCLD-782
PCI-1712/1712L	PCL-10168	PCLD-8712		
PCI-1721/1723/1780U	PCL-10168	ADAM-3968		PCLD-782B
PCI-1751	PCL-10168	ADAM-3968		PCLD-785
		ADAM-3968/50	PCL-10150	
		ADAM-3968/20	PCL-10120	
PCI-1713U/1715U	PCL-10137	ADAM-3937 PCLD-881B		PCLD-785B
PCI-1720U/1727U/1730U/1733/ 1734/1750/1760U/1761	PCL-10137	ADAM-3937		
PCI-1784U	PCI-10137H			
PCI-1753	PCL-10268	PCLD-8751/8761/8762		PCLD-885
		ADAM-3968		
		ADAM-3968/50	PCL-10150	
		ADAM-3968/20	PCL-10120	
PCI-1752U/1754/1756	PCL-10250	ADAM-3951		PCLD-786
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PCI-1240U	PCL-10251	ADAM-3952		PCLD-7216
		ADAM-3952M		
PCI-1714U/1714UL	PCL-10901	ADAM-3909		
	PCL-1010B			

Recommended Cables, I/O Wiring Terminal Boards and Isolated Digital I/O Terminals for Connecting to ISA Data Acquisition (DAQ) Cards



- 1 Operator Panels
- 2 Fanless Panel PCs
- 3 Panel Computers
- 4 Display Solutions
- 5 Ethernet Switches
- 6 Device Servers
- 7 Serial Comm. Cards
- 8 Video Surveillance
- 9 Pre-Configured Systems
- 10 IPC Chassis
- 11 SBCs and Backplanes
- 12 Industrial Motherboards
- 13 Embedded IPCs
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ADAM-3000 Series



Features

- 1,000 V_{DC} three-way isolation
- Easy input/output range configuration
- Flexible DIN-rail mounting
- Linearized thermocouple/RTD measurement
- Low power consumption
- Wide input bandwidth

Introduction

The ADAM-3000 Series consist of the most cost-efficient, field configurable, isolation-based, signal conditioners on the market today. The modules are easily installed to protect your instruments and process signals from the harmful effects of ground loops, motor noise, and other electrical interferences.

Affordable Signal Isolation Solution

Featuring optical isolation technology, the ADAM-3000 modules provide three-way (input/output/power) 1,000 V_{DC} isolation. Optical isolation provides pin-point accuracy and stability over a wide range of operations at minimal power consumption.

Flexible Analog Data Conversion

The input/output range for the ADAM-3000 modules can be configured through switches located inside the module. The modules accept voltage, current, thermocouple or RTD as input, and pass voltage or current as output.

Thermocouple input is handled by the built-in input thermocouple linearization circuitry and a cold junction compensation function. These ensure accurate temperature measurement and accurate conversion of this information to the voltage or current output.

Configuration

The ADAM-3000 modules use 24 V_{DC} power. This electrical power wiring can be acquired from adjacent modules, which greatly simplifies wiring and maintenance. The I/O configuration switches are located inside the modules. To reach the switches, simply remove the modules from the DIN-rail bracket by sliding the modules downward.

Modular Industrial Design

The ADAM-3000 modules can be easily mounted on a DIN-rail, and signal wires can be connected through screw terminals. The screw terminals and input/output configuration switches are built inside the industrial grade plastic casing. With simple two-wire input/output cables, wiring is easy and reliable in harsh industrial environments.

Applications

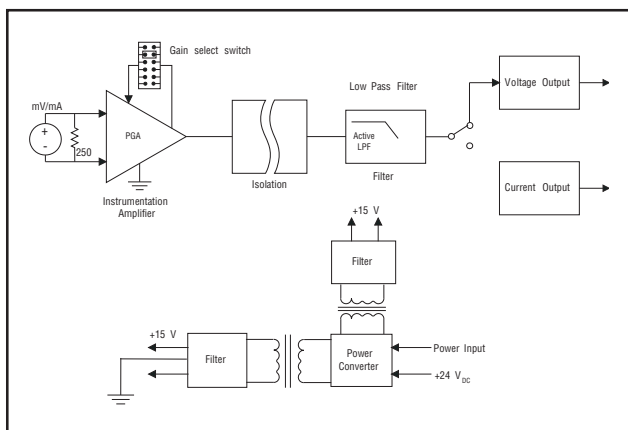
- Signal isolation
- Signal transmitters
- Thermocouple/RTD/strain gauge measurements
- Signal amplifiers
- Noise filter

Common Specifications

- **Isolation** 1,000 V_{DC}
- **Indicators** Power LED indicator
- **Power Requirement** 24 V_{DC} ± 10%
- **Case** ABS
- **Screw Terminal** Accepts 0.5 mm² ~ 2.5 mm²
1- #12 or 2- #14 ~ #22 AWG
- **Operating Temperature** 0 ~ 70° C (32 ~ 158° F)
(ADAM-3011: 0 ~ 50° C (32 ~ 122° F))
- **Storage Temperature** -25 ~ 85° C
(-13 ~ 185° F)

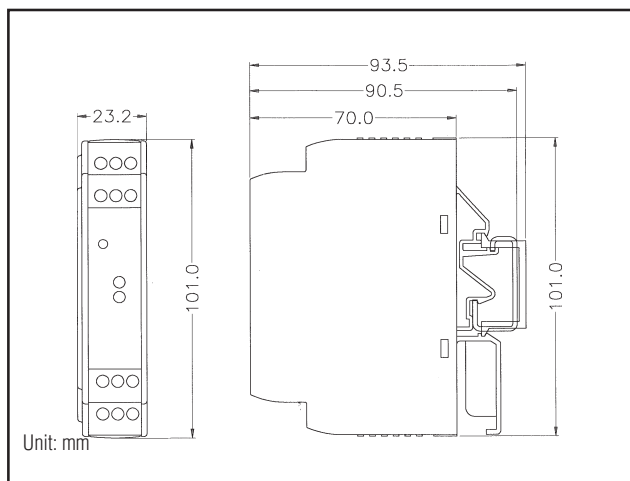
Isolated Signal Conditioning Modules

Block Diagram



Block Diagram of ADAM-3014

Dimensions

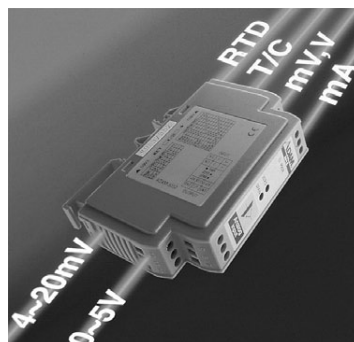


ADAM-3000 Series Modules



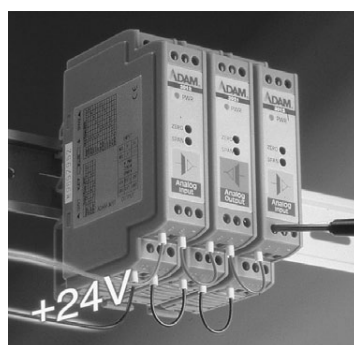
Three-way Signal Isolation

Three-way (input/output/power)
1,000 V_{DC} isolation.



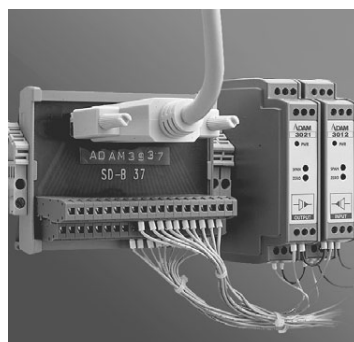
Field Configurable I/O Range

The I/O range can be configured on site with switches inside the module.



Easy Daisy Chain Power Wiring

Power can be connected conveniently from adjacent modules.



Interfacing to DAQ Cards

A wiring adapter can connect modules to a data acquisition card.

- 1 Operator Panels
- 2 Fanless Panel PCs
- 3 Panel Computers
- 4 Display Solutions
- 5 Ethernet Switches
- 6 Device Servers
- 7 Serial Comm. Cards
- 8 Video Surveillance
- 9 Pre-Configured Systems
- 10 IPC Chassis
- 11 SBCs and Backplanes
- 12 Industrial Motherboards
- 13 Embedded IPCs
- 14 Mobile Computers
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ADAM-3011

ADAM-3013

ADAM-3014

Isolated Thermocouple Input Module

Isolated RTD Input Module

Isolated DC Input/Output Module



ADAM-3011



Specifications

Thermocouple Input

- Common Mode Rejection 115 dB min
- Input Type

T/C type	Temperature Range (° C)	Accuracy at 25° C (° C)
J	-40 ~ 760	±2
K	0 ~ 1,000	±2
T	-100 ~ 400	±2
E	0 ~ 1,000	±2
S	500 ~ 1,750	±4
R	500 ~ 1,750	±4
B	500 ~ 1,800	±4

- Isolation (Three-way) 1,000 V_{DC}
- Output Impedance 0.5 Ω
- Stability (Temperature Drift) ±2° C
- Voltage Output 0 ~ 10 V

General

- Certifications CE, FM
- Connectors Screw terminal
- Enclosure ABS
- Indicators Power LED indicator
- Isolation 1,000 V_{DC}
- Power Consumption 1.4 W
- Power Input 24 V_{DC} ± 10%
- Operating Temperature 0 ~ 50° C (32 ~ 122° F)
- Storage Temperature -25 ~ 85° C (-13 ~ 185° F)

Ordering Information

- ADAM-3011 Isolated Thermocouple Input Module



ADAM-3013



Specifications

RTD Input

- Accuracy ± 0.1% of full range (voltage) or +/- 0.15° C (voltage)
± 0.2% of full range (current)
- Bandwidth 4 Hz
- Input CMR at DC 92 dB min.
- Input Connections 2, 3 or 4 wires
- Input Type

RTD type	α	Temperature Range (° C)
Pt	0.00385	-100 ~ 100
Pt	0.00385	0 ~ 100
Pt	0.00385	0 ~ 200
Pt	0.00385	0 ~ 600
Pt	0.00385	-100 ~ 0
Pt	0.00385	-100 ~ 200
Pt	0.00385	-50 ~ 50
Pt	0.00385	-50 ~ 150
Pt	0.00392	-100 ~ 100
Pt	0.00392	0 ~ 100
Pt	0.00392	0 ~ 200
Pt	0.00392	0 ~ 600
Ni	N/A	0 ~ 100
Ni	N/A	-80 ~ 100

- Output Range 0 ~ 5 V, 0 ~ 10 V, 0 ~ 20 mA
- Output Resistance < 5 Ω
- Temperature Drift ± 30 ppm of full range

General

- Certifications CE, FM
- Connectors Screw terminal
- Enclosure ABS
- Indicators Power LED indicator
- Isolation 1,000 V_{DC}
- Power Consumption < 0.95 W
- Power Input 24 V_{DC} ± 10%
- Operating Temperature 0 ~ 70° C (32 ~ 158° F)
- Storage Temperature -25 ~ 85° C (-13 ~ 185° F)

Ordering Information

- ADAM-3013 Isolated RTD Input Module



ADAM-3014



Specifications

I/O

- Accuracy ±0.1% of full range (typical)
- Common Mode Rejection > 100 dB @ 50 Hz/60 Hz
- Current Input Bipolar: ±20 mA
Unipolar: 0 ~ 20 mA
Input impedance: 250 Ω
- Current Output 0 ~ 20 mA
- Stability (Temperature Drift) 150 ppm (typical)
- Voltage Input Bipolar input: ±10 mV, ±50 mV, ±100 mV, ±0.5 V, ±1.0 V, ±5 V, ±10 V
Unipolar input: 0 ~ 10 mV, 0 ~ 50 mV, 0 ~ 100 mV, 0 ~ 0.5 V, 0 ~ 1 V, 0 ~ 5 V, 0 ~ 10 V
Input impedance: 2 MΩ
Input bandwidth: 2.4 kHz (typical)
- Voltage Output Bipolar: ±5 V, ±10 V
Unipolar: 0 ~ 10 V
Impedance: < 50 Ω
Drive: 10 mA max.

General

- Certifications CE, FM
- Connectors Screw terminal
- Enclosure ABS
- Indicators Power LED indicator
- Isolation (Three-way) 1,000 V_{DC}
- Power Consumption 0.85 W (voltage output)
1.2 W (current output)
- Power Input 24 V_{DC} ± 10%
- Operating Temperature -10 ~ 70° C (14 ~ 158° F)
- Storage Temperature -25 ~ 85° C (-13 ~ 185° F)

Ordering Information

- ADAM-3014 Isolated DC Input/Output Module

ADAM-3016

ADAM-3112

ADAM-3114

Isolated Strain Gauge Input Module

Isolated AC Voltage Input Module

Isolated AC Current Input Module



ADAM-3016



ADAM-3112



ADAM-3114



Specifications

I/O

- Accuracy: $\pm 0.1\%$ of full range
- Bandwidth: 2.4 kHz (typical)
- Isolation Mode Rejection: >100 dB @ 50 Hz/60 Hz
- Current Output: Current: 0 ~ 20 mA
Current load resistor: 0 ~ 500 Ω (Source)
150 ppm (typical)
- Stability (Temperature Drift): 150 ppm (typical)
- Voltage Specifications: Electrical input: ± 10 mV, ± 20 mV, ± 30 mV, ± 100 mV
Excitation voltage: 1 ~ 10 V_{DC} (60 mA max)
- Voltage Output: Bipolar: ± 5 V, ± 10 V
Unipolar: 0 ~ 10 V
Impedance: $< 50 \Omega$

General

- Certifications: CE
- Connectors: Screw terminal
- Enclosure: ABS
- Indicators: Power LED indicator
- Isolation (Three-way): 1,000 V_{DC}
- Power Consumption: ≤ 1.85 W (voltage output)
 ≤ 2.15 W (current output)
- Power Input: 24 V_{DC} $\pm 10\%$
- Operating Temperature: -10 ~ 70° C (14 ~ 158° F)
- Storage Temperature: -25 ~ 85° C (-13 ~ 185° F)

Ordering Information

- ADAM-3016: Isolated Strain Gauge Input Module

Specifications

Voltage Input

Full Range Mode		400 V	250 V	120 V
Input Voltage	AC (V _{RMS})	0 ~ 400	0 ~ 250	0 ~ 120
	DC (V)	0 ~ 400	0 ~ 250	0 ~ 120
Input Impedance		48 k	30 k	14.4 k

Voltage Output

- Output Signal: 0 ~ 5 V_{DC}
- Accuracy: $< \pm 1.0\%$ for full range
- Output Impedance: $< 10 \Omega$ @ operating frequency < 60 Hz
- Load: > 10 k Ω
- Ripple: < 120 mVp-p
- Temperature Coefficient: 400 ppm/° C
- Input Bandwidth: 6 kHz

Power Consumption

- Supply Voltage: 24 V_{DC} $\pm 10\%$
- Current Consumption: 40 mA

General

- Isolation Protection: 1,000 V_{DC} (output to power)
2,500 V_{RMS} (input to output, input to power)
- Operating Temperature: 0 ~ 60° C (32 ~ 140° F)
- Storage Temperature: -20 ~ 70° C (-4 ~ 158° F)
- Storage Humidity: 5 ~ 95 %

Ordering Information

- ADAM-3112: Isolated AC Voltage Input Module

Specifications

Current Input

- AC Current Input: 0 ~ 5 A_{RMS}
- DC Current Input: 0 ~ 5 A

Voltage Output

- Output Signal: 0 ~ 5 V_{DC}
- Accuracy: $< \pm 1.0\%$ for full range
- Output Impedance: $< 10 \Omega$ @ operating frequency < 60 Hz
- Load: > 10 k Ω
- Ripple: < 120 mVp-p
- Temperature Coefficient: 400 ppm/° C
- Input Bandwidth: 10 kHz

Power Consumption

- Supply Voltage: 24 V_{DC} $\pm 10\%$
- Current Consumption: 40 mA

General

- Isolation Protection: 1,000 V_{DC} (output to power)
2,500 V_{RMS} (input to output, input to power)
- Operating Temperature: 0 ~ 60° C (32 ~ 140° F)
- Storage Temperature: -20 ~ 70° C (-4 ~ 158° F)
- Storage Humidity: 5 ~ 95 %

Ordering Information

- ADAM-3114: Isolated AC Current Input Module

1
Operator Panels

2
Fanless Panel PCs

3
Panel Computers

4
Display Solutions

5
Ethernet Switches

6
Device Servers

7
Serial Comm. Cards

8
Video Surveillance

9
Pre-Configured Systems

10
IPC Chassis

11
SBCs and Backplanes

12
Industrial Motherboards

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Embedded IPCs

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Mobile Computers

15
IPC Peripherals

16
DAQ

17
Signal Conditioning

18
USB DAQ

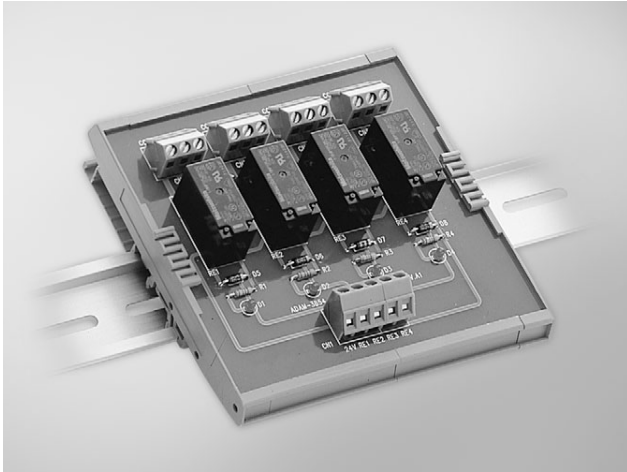
ADAM-3854

ADAM-3864

4-ch Power Relay Module

4-ch Solid State Digital I/O Module

Carrier Backplane



ADAM-3854

Features

- High power relays can handle up to 5 A @ 250 V_{AC} and 5 A @ 30 V_{DC}
- 4 single-pole double-throw (SPDT) relays
- Industrial screw terminals for easy output wiring
- LED status indicators
- Onboard varistor protects relay contact points
- DIN-rail mounting

Specifications

I/O

- **Channels** 4
- **Contact Rating** 250 V_{AC} @ 5 A
30 V_{DC} @ 5 A
- **Contact Resistance** 100 mΩ
- **Operation Time** 15 ms max.
- **Relay Type** SPDT (Form C)
- **Release Time** 5 ms max.
- **Life Expectancy** 1.7 x 10⁵ at rated load

Varistor

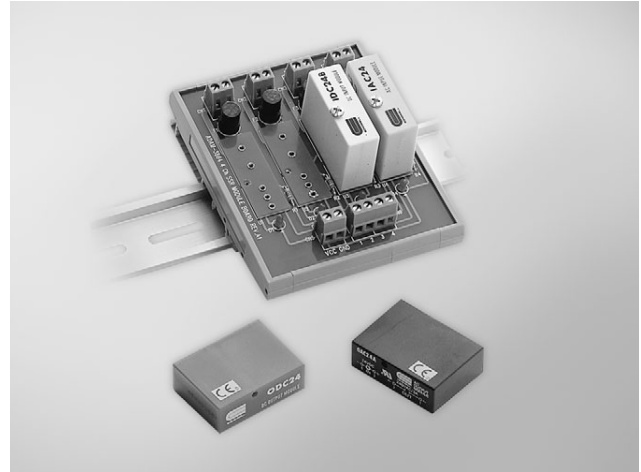
- **Clamping Voltage** 760 V (10 A)
- **Max. Applied Voltage** 300 V_{RMS}
- **Max. Peak Current** 1,200 A for 8 ms
- **Varistor Voltage** 470 V (current = 1 mA)

General

- **Connectors** Screw terminals
- **Dimensions (L x W x H)** 112.5 x 118.4 x 46 mm (4.43" x 4.66" x 1.81")
- **LED Indicators** Status displayed for each relay
- **Mounting** DIN-rail
- **Power Consumption** 2.2 W
- **Power Input** 24 V_{DC}

Ordering Information

- **ADAM-3854** 4-ch DIN-rail Power Relay Module



ADAM-3864

Features

- 2,500 V_{RMS} optical isolation
- LED status indicators
- Onboard fuse protection
- DIN-rail mounting

Specifications

Input Modules

Field Side:

- **Input On/Off Voltage** IAC24A series: 180 ~ 280 V/80 V_{RMS}
Range IDC24B series: 3 ~ 32 V/1 V_{DC}
- **Input Resistance** IAC24A series: 44 kΩ
IDC24B series: 1.5 kΩ

Logic Side:

- **Breakdown Voltage** 30 V_{DC}
- **Output Current** 100 mA max.
- **Output Voltage Drop** 0.4 V max.
- **Supply Current** 12 mA max.
- **Supply Voltage** 24 V_{DC}

Output Modules

Field Side:

- **Contact Voltage Drop** 1.6 V max.
- **Current Rating** 3 A max. (@ 25° C)

Logic Side:

- **Input Resistance** 220 Ω
- **Supply Current** 12 mA max.
- **Supply Voltage** 24 V

General

- **Dimensions (L x H x W)** 118.4 x 90 x 59 mm (4.66" x 3.54" x 2.32")
- **Mounting** DIN-rail

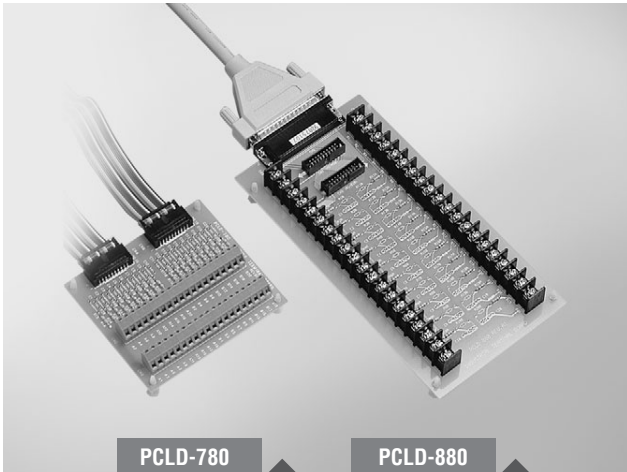
Ordering Information

- **ADAM-3864** 4-ch Solid State Module Carrier Backplane
- **OAC24A** AC Output Module (24-280 V_{AC}, 3 A)
- **ODC24** DC Output Module (5-60 V_{DC}, 3 A)
- **PCLM-ODC5** Single Piece DC SSR Module (60 V_{DC}, 3 A)
- **IAC24A** AC Input Module (180-280 V_{AC})
- **IDC24B** DC Input Module (3-32 V_{DC})

PCLD-780 PCLD-880

Screw Terminal Board with Flat Cables

Wiring Terminal Board with Flat Cables and Adapter



Features

- Pin to pin design
- Low-cost universal screw-terminal boards for industrial applications
- 40 terminal points for two 20-pin flat cable connector ports
- Reserved space for signal-conditioning circuits such as low-pass filter, voltage attenuator and current-to-voltage conversion
- Table-top mounting using nylon standoffs. Screws and washers provided for panel or wall mounting

PCLD-780 Only

- Screw-clamp terminal-blocks allow easy and reliable connections
- Dimensions: 102 x 114 mm (4.0" x 4.5")

PCLD-880 Only

- Supports PC-LabCard™ products with DB37 connectors
- Industrial-grade terminal blocks (barrier-strip) permit heavy-duty and reliable connections
- Dimensions: 221 x 115 mm (8.7" x 4.5")

Introduction

PCLD-780 and PCLD-880 universal screw-terminal boards provide convenient and reliable signal wiring for PC-LabCard™ products with 20-pin flat-cable connectors. PCLD-880 is also equipped with a DB37 connector to support PC-LabCard™ products with DB37 connectors.

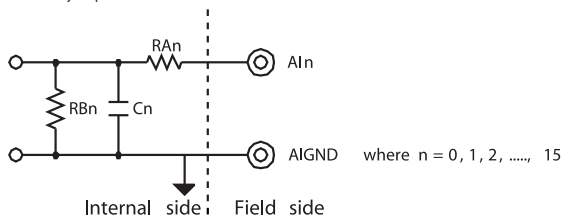
PCLD-780 and PCLD-880 let you install passive components on the special PCB layout to construct your own signal-conditioning circuits. You can easily construct a low-pass filter, attenuator or current-to-voltage converter by adding resistors and capacitors onto the board's circuit pads.

Applications

- Field wiring for analog and digital I/O channels of PC-LabCard™ products which employ the standard 20-pin flat cable connectors or DB37 connectors (only PCLD-880)
- Signal conditioning circuits can be implemented as illustrated in the following examples:

a) Straight-through connection (factory setting)

$R_{An} = 0\Omega$ jumper



$R_{Bn} = \text{none}$

$C_n = \text{none}$

b) 1.6 kHz (3dB) low pass filter

$R_{An} = 10\text{ K}\Omega$

$R_{Bn} = \text{none}$

$C_n = 0.01\mu\text{F}$

$$f_{3dB} = \frac{1}{2\pi R_{An} C_n}$$

c) 10 : 1 voltage attenuator

$R_{An} = 9\text{ K}\Omega$

$R_{Bn} = 1\text{ K}\Omega$

$C_n = \text{none}$

$$\text{Attenuation} = \frac{R_{Bn}}{R_{An} + R_{Bn}}$$

(Assume source impedance $\ll 10\text{ K}\Omega$)

d) 4 ~ 20 mA to 1 ~ 5 V_{DC} signal converter

$R_{An} = 0\Omega$ (short)

$R_{Bn} = 250\Omega$ (0.1% precision resistor)

$C_n = \text{none}$

Pin Assignments

CN1			
A1	1	2	A2
A3	3	4	A4
A5	5	6	A6
A7	7	8	A8
A9	9	10	A10
A11	11	12	A12
A13	13	14	A14
A15	15	16	A16
A17	17	18	A18
A19	19	20	A20

CN2			
B1	1	2	B2
B3	3	4	B4
B5	5	6	B6
B7	7	8	B8
B9	9	10	B10
B11	11	12	B12
B13	13	14	B14
B15	15	16	B16
B17	17	18	B18
B19	19	20	B20

CN5 (PCLD-880 only)

A1	1	20	A2
A3	2	21	A4
A5	3	22	A6
A7	4	23	A8
A9	5	24	A10
A11	6	25	A12
A13	7	26	A14
A15	8	27	A16
A17	9	28	A18
A19	10	29	A20
B1	11	30	B2
B3	12	31	B4
B5	13	32	B6
B7	14	33	B8
B9	15	34	B10
B11	16	35	B12
B13	17	36	B14
B15	18	37	B16
B17	19		

Ordering Information

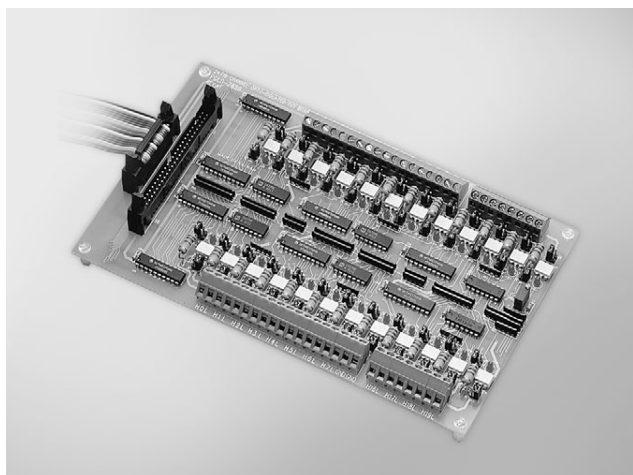
- PCLD-780 Screw Terminal Board w/ Two 20-pin Flat Cables
- PCLD-880 Wiring Board w/ Two 20-pin Flat Cables & Adapter
- PCL-10137-1 DB37 Cable, 1 m
- PCL-10137-2 DB37 Cable, 2 m
- PCL-10137-3 DB37 Cable, 3 m
- PCL-10120-1 20-pin Flat Cable, 1 m
- PCL-10120-2 20-pin Flat Cable, 2 m

PCLD-782

PCLD-782B

16-ch Opto-Isolated Digital Input Board

24-ch Opto-Isolated Digital Input Board



CE

Features

- Compatible with all PC-LabCard™ products with DI channels on either 20-pin flat cable or 50-pin Opto-22 compatible connectors
- 16 or 24 optically-isolated digital input channels
- Built-in screw terminals for easy input wiring
- LEDs indicate input logic status
- Inputs buffered with voltage comparators

Introduction

PCLD-782 and PCLD-782B digital input daughterboards feature high-voltage ($> 1,500 V_{DC}$) optical isolation on all inputs. PCLD-782 provides 16 input channels accessible through one 20-pin flat cable connector, which is standard on most PC-LabCard™ products. The PCLD-782B provides either 16 or 24 channels, depending on what connector you use. The PCLD-782B's 20-pin connector lets you access 16 channels, similar to the PCLD-782, but also provides a 50-pin Opto-22 connector with access to 24 channels.

Both cards have onboard screw terminals for easy input wiring. Optically isolated signal conditioning provides isolation between separate channels, as well as between each input channel and the PC. This isolation prevents floating potential and ground loop problems while protecting the input lines from potentially damaging fault conditions.

Specifications

Isolated Digital Input

- Input Channels** PCLD-782: 16
PCLD-782B: 24
- Input Range** 0 ~ 24 V_{DC}
- Input Resistance** 560 Ω
- Isolation Voltages** 1,500 V_{DC} min.
- Threshold Voltage** 1.5 V_{DC} (VR adjustable)

General

- Certifications** CE
- Connectors**
Digital Input: Screw terminals (#12 ~ 22 AWG)
Controller: PCLD-782: 1 x 20-pin box header (CN1)
PCLD-782B: 1 x 20-pin box header (CN1) and 1 x 50-pin box header (CN2)
- Dimensions (L x W)** PCLD-782: 3U— 205 x 114 mm (8.1" x 4.5")
PCLD-782B: 4U— 220 x 132 mm (8.7" x 5.2")
- LED Indicators** Indicates input logic status
- Mounting** 4 x screw holes for flat surface mounting

Ordering Information

- PCLD-782** 16-ch Isolated DI Board w/ 1m 20-pin Flat Cable
- PCLD-782B** 24-ch IDI Board w/ 20-pin & 50-pin Flat Cables
- PCL-10120-1** 20-pin Flat Cable, 1 m
- PCL-10120-2** 20-pin Flat Cable, 2 m
- PCL-10150-1.2** 50-pin Flat Cable, 1.2 m

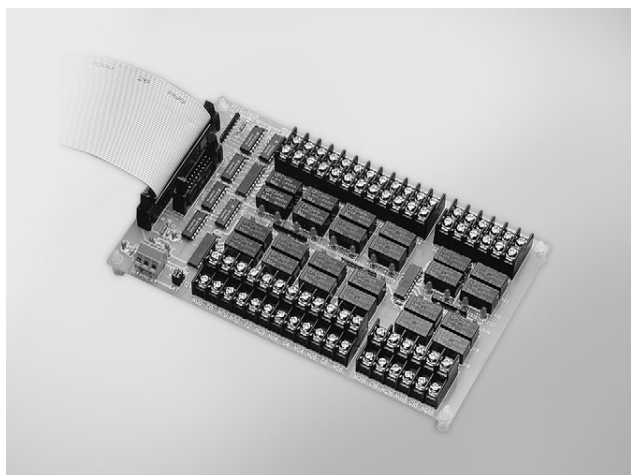
Pin Assignments

CN1				CN2			
DI0	1	2	DI1	DI23	1	2	GND
DI2	3	4	DI3	DI22	3	4	GND
DI4	5	6	DI5	DI21	5	6	GND
DI6	7	8	DI7	DI20	7	8	GND
DI8	9	10	DI9	DI19	9	10	GND
DI10	11	12	DI11	DI18	11	12	GND
DI12	13	14	DI13	DI17	13	14	GND
DI14	15	16	DI15	DI16	15	16	GND
GND	17	18	GND	DI15	17	18	GND
+5 V	19	20	+12 V	DI14	19	20	GND
				DI13	21	22	GND
				DI12	23	24	GND
				DI11	25	26	GND
				DI10	27	28	GND
				DI9	29	30	GND
				DI8	31	32	GND
				DI7	33	34	GND
				DI6	35	36	GND
				DI5	37	38	GND
				DI4	39	40	GND
				DI3	41	42	GND
				DI2	43	44	GND
				DI1	45	46	GND
				DI0	47	48	GND
				+5 V	49	50	GND

PCLD-785/B PCLD-885

16/24-ch Relay Board

16-ch Power Relay Board



PCLD-785/B



Features

- Compatible with PC-LabCard™ products with 20-pin digital output connector and 50-pin Opto-22 digital output connector (PCLD-785B only)
- Automatic selection of control logic (PCLD-785B only): Negative logic for the Opto-22 connector Positive logic for the 20-pin flat cable connector
- Screw terminals for easy output wiring
- LED status indicators

Specifications

Relay

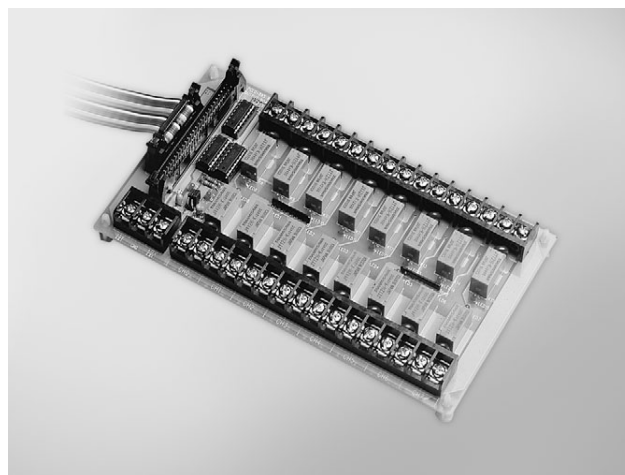
- Channels** PCLD-785: 16 (CN1, 20-pin conn.)
PCLD-785B: 16 (CN1, 20-pin conn.)
24 (CN2, 50-pin conn.)
- Contact Ratings** 120 V_{AC} @ 0.5 A, 30 V_{DC} @ 1 A
- Contact Resistance** < 100 mΩ
- Operation Time** 5 ms max.
- Insulation Resistance** 100 MΩ
- Life Expectancy** 5 x 10⁵ @ 110 V_{AC} / 0.3 A
5 x 10⁵ @ 24 V_{DC} / 1.25 A
- Relay Type** SPDT (Single-Pole Double-Throw) Form C
- Release Time** 5 ms max.

General

- Dimensions (L x W)** PCLD-785: 114 x 220 mm (4.5" x 8.7")
PCLD-785B: 132 x 220 mm (5.2" x 8.7")
- Power Consumption** 5 V @ < 100 mA; 12 V @ 33 mA for each relay
- Connectors** 20-pin connector:
5 V_{DC}: Jumper select either PC bus or external supply
12 V_{DC}: Jumper select either PC bus or external supply
50-pin connector: external 12 V supply

Ordering Information

- PCLD-785** 16-ch Relay Board w/ One 1m 20-pin Flat Cable
- PCLD-785B** 24-ch Relay Board w/ 20-pin & 50-pin Flat Cables
- PCL-10120-1** 20-pin Flat Cable, 1 m
- PCL-10120-2** 20-pin Flat Cable, 2 m
- PCL-10150-1.2** 50-pin Flat Cable, 1.2 m



PCLD-885



Features

- Accepts 20-pin or 50-pin (Opto-22 compatible) connectors
- 16 single-pole single-throw (SPST) relays
- High-power relay handles up to 5 A @ 250 V_{AC}
- Onboard varistors protect all relay contact points
- Industrial screw terminals for ease of wiring
- LED status indicators
- 5 V / 12 V power/status LED indicator

Specifications

Relay

- Channels** 16
- Contact Rating** 250 V_{AC} @ 6 A
30 V_{DC} @ 5 A
- Contact Resistance** 30 mΩ max.
- Insulation Resistance** 1,000 MΩ @ 500 V_{DC}
- Life Expectancy** >100,000 cycles at rated load
- Relay On Time** 6 ms max.
- Relay Off Time** 3 ms max.
- Relay Type** SPST (Form A), normally open

Varistor

- Clamping Voltage** 760 V (10 A)
- Max. Peak Current** 1,200 A for 8 msec.
- Max. Applied Voltage** 300 V_{RMS} AC continuous
- Varistor Voltage** 470 V (current = 1 mA)

General

- Power Consumption** 12 V @ 22 mA for each relay,
352 mA if all relays energized; 5 V @ 200 mA max.
- Connectors** Input:
Output:
20-pin flat cable or 50-pin Opto-22 compatible
Barrier strip screw terminal
- Dimensions (L x W)** 205 x 114 mm (8" x 4.5")
- Operating Temperature** 0 ~ 60° C (32 ~ 140° F)

Ordering Information

- PCLD-885** 16-ch Power Relay Board w/ 20p & 50p Flat Cables

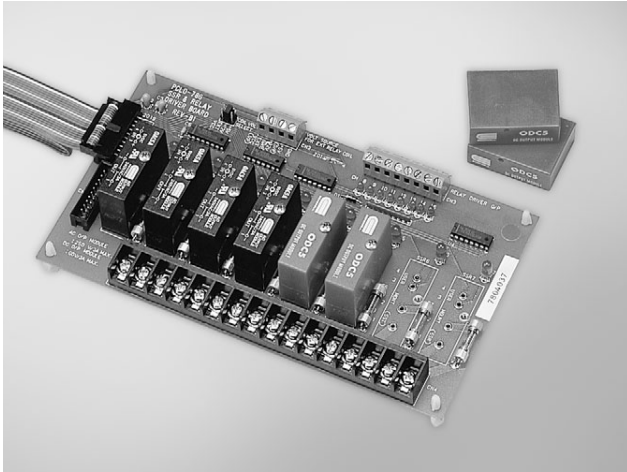
- Operator Panels
- Fanless Panel PCs
- Panel Computers
- Display Solutions
- Ethernet Switches
- Device Servers
- Serial Comm. Cards
- Video Surveillance
- Pre-Configured Systems
- IPC Chassis
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- DAQ
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PCLD-786

PCLD-7216

8-ch SSR I/O Module Carrier Board

16-ch SSR I/O Module Carrier Board



PCL-10120-1

PCLD-786

PCLM-ODC5



Features

- Up to eight AC or DC solid state relay modules
- Photo-coupler isolated operation
- Eight external relay drivers
- LED status indicators

Specifications

AC Solid State Relays

- 1 Cycle Surge 40 A
- Blocking Voltage ± 600 V min.
- Off Leakage Current 8 mA max.
- On-state Voltage 1.6 V max.
- Output Rating 24 ~ 280 V_{AC} @ 3.0 A
- Turn On zero volts
- Turn On/Turn Off Time < 1/2 cycle
- Type PCLM-OAC5A

DC Solid State Relays

- 1 Second Surge 5 A
- OFF Leakage Current 1 mA max.
- ON-state Voltage 1.4 V max.
- Output Rating 5 ~ 60 V_{DC} @ 3.0 A
- Turn On/Turn Off Time 750 μ s max.
- Type PCLM-ODC5

External Relay Drivers

- Channels 8
- Coil Driving Voltage 5 V, 12 V from PC or external source
- Driver Type ULN2003, open collector type
- Max. Driving Current 125 mA each channel

General

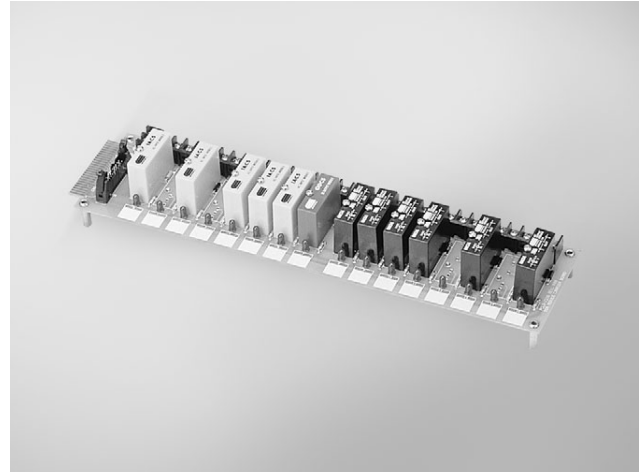
- Dimensions (L x W) 205 x 114 mm (8.1" x 4.5")

Ordering Information

- PCLD-786 8-ch SSR I/O Module Board w/ 20-pin Flat Cable

Note: PCLD-786 does not include SSRs. They must be ordered by selecting single piece SSR modules according to your requirements.

- PCLM-OAC5A Single Piece AC SSR Module (280 V_{AC}, 3 A)
- PCLM-ODC5 Single Piece DC SSR Module (60 V_{DC}, 3 A)



PCLD-7216



Features

- Channel status reflected by onboard LED for easy monitoring
- Onboard fuse protection

Specifications

Module Type		Field Side		Logic Side
Output Modules	Part No.	Output Voltage Rating	Output Current Rating	Input Logic and SSR Status
AC Output	PCLM-OAC5A	24 ~ 280 V _{AC}	3.0 A	TTL low (On)
		12 ~ 280 V _{AC}		TTL high (Off)
DC Output	PCLM-ODC5	5 ~ 60 V _{AC}	3.0 A	TTL low (On)
				TTL high (Off)
Input Modules	Part No.	Input On Voltage	Input Off Voltage	Output Logic and On/Off Status
AC Input	PCLM-IAC5A	180 ~ 280 V _{AC}	< 80 V	TTL low (On)
				TTL high (Off)
DC Input	PCLM-IDC5B	3 ~ 32 V _{AC}	< 1 V	TTL low (On)
				TTL high (Off)

Input Modules

Field Side:

- Input On/Off Voltage Range PCLM-IAC5: 90 ~ 140 V/45 V_{RMS}
PCLM-IAC5A: 180 ~ 280 V/80 V_{RMS}
PCLM-IDC5B: 3 ~ 32 V/1 V_{DC}
PCLM-IAC5: 14 k Ω , PCLM-IAC5A: 44 k Ω ,
PCLM-IDC5B: 1.5 k Ω
- Input Resistance
- Turn On/Off Time PCLM-IAC5: 20 msec. max., PCLM-IAC5A: 20 msec. max.
PCLM-IDC5B: 100 msec. max.

Logic Side:

- Breakdown Voltage 30 V_{DC}
- Output Current 100 mA max.
- Output Voltage Drop 0.4 V max.
- Supply Current 12 mA max.
- Supply Voltage 4 ~ 6 V

Output Modules

Field Side:

- Current Rating 3 A max. (@ 25° C)
- Contact Voltage Drop 1.6 V max.
- Turn On/Off Time PCLM-OAC series: 1/2 AC cycle max.
PCLM-ODC series: 100 μ s/750 μ s max.

Logic Side:

- Input Resistance 220 Ω
- Supply Voltage 4 ~ 6 V
- Supply Current 12 mA max.

General

- Logic Side Connectors 50-pin edge connector, Opto-22 compatible
- Dimensions (L x W x H) 367 x 111 x 56 mm (14.4" x 4.4" x 2.2")

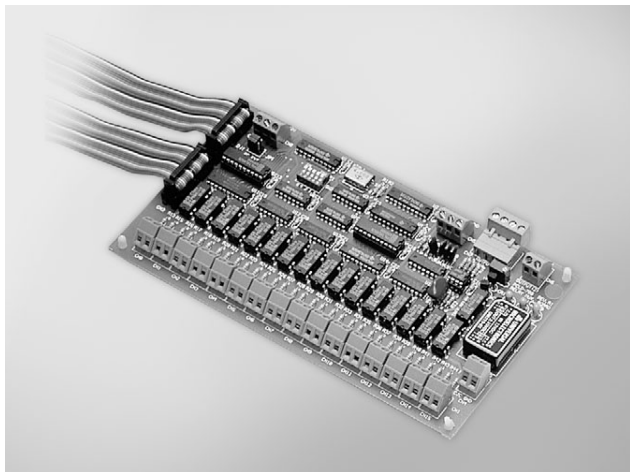
Ordering Information

- PCLD-7216 16-ch SSR I/O Module Carrier Board

Note: PCLD-7216 does not include SSRs. They must be ordered by selecting single piece SSR modules according to your requirements.

PCLD-788

16-ch Relay Multiplexer Board



Features

- 16 to 1 channel expansion
- Differential and fully isolated multiplexing
- Break-before-make relay control
- "Channel closed" signal for precise A/D triggering
- Up to 16 PCLD-788s can be cascaded for 256 channels
- Easy wiring for large channel count configuration
- Onboard cold-junction circuitry for thermocouple measurement

Introduction

PCLD-788 multiplexes 16 channels into a single I/O channel of an A/D converter, voltmeter or IEEE-488-based instrument. Up to 16 PCLD-788s can be cascaded for a total of 256 fully-isolated differential channels. The PCLD-788 can be controlled by any PC-LabCard™ product via a 16-bit 20-pin digital output port, found on cards such as the PCL-711B, PCL-812PG or the PCL-818 series. Channel selection (0-15) and board selection (0-15) are done by programming the high-order four bits and low order four bits of a digital output byte from the main I/O card in use.

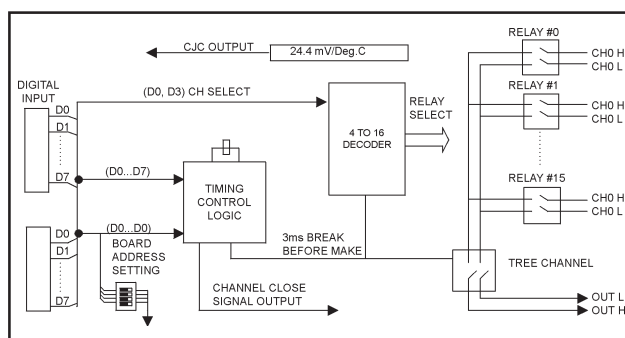
Specifications

I/O

- **Channel Closed Signal** TTL-level pulse
- **Cold-junction Sensor** 24.4 mV/°C, 0 V at 0°C
Output
- **Contact Rating** Break-before-make with 3 msec. minimum break time
- **Contact Resistance** 200 mΩ max.
- **Input Channels** 16 isolated differential inputs
- **Programming** DO bit 0, 1, 2 and 3 for channel selection, DO bit 4, 5, 6 and 7 for board selection. Onboard DIP switches for board-address setting
- **Max. Input Voltage** 100 V_{DC} or 100 V peak AC
- **Max. Switching Current** 0.5 A
- **Max. Switching Power** 10 VA
- **Operating Time** 1 ms max.
- **Relay Life Expectancy** 100 million cycles min. at 10 V_{DC} and 1 mA
- **Release Time** 1 msec. max.

General

- **Certifications** CE
- **Connectors**
Controller: 2 x 20-pin box header, second connector in parallel for daisy chaining
I/O: Screw terminals
- **Dimensions (L x W)** 205 x 114 mm (8" x 4.5")
- **Mounting** 4 x screw holes for flat surface mounting
- **Power Consumption** 5 V @ 380 mA max.



PCLD-788 Block Diagram

Pin Assignments

CN2 & CN3					
C0	1	2	C1		
C2	3	4	C3		
C4	5	6	C5		
C6	7	8	C7		
	9	10			
	11	12			
	13	14			
	15	16			
GND	17	18	GND		
+5V	19	20	+12V		

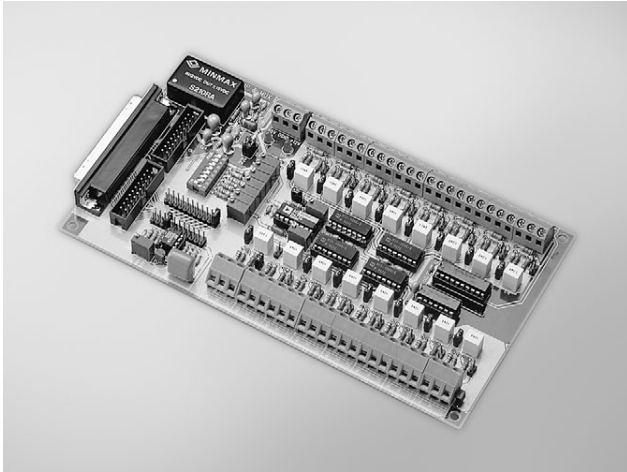
Ordering Information

- **PCLD-788** 16-ch Relay MUX Board w/ Two 20-pin Flat Cables
- **PCL-10120-1** 20-pin Flat Cable, 1 m
- **PCL-10120-2** 20-pin Flat Cable, 2 m

- 1 Operator Panels
- 2 Fanless Panel PCs
- 3 Panel Computers
- 4 Display Solutions
- 5 Ethernet Switches
- 6 Device Servers
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- 10 IPC Chassis
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- 18 USB DAQ

PCLD-789D

Amplifier and Multiplexer Board



CE

Features

- Multiplexes 16 differential inputs to one A/D input
- Expands a PC-LabCard™ product's analog inputs to 128 channels
- High-grade instrumentation amplifier provides switch selectable gains of 1, 2, 10, 50, 100, 200, 1,000
- Onboard cold-junction compensation circuits for direct thermocouple measurement
- Built-in signal conditioning functions include filter, attenuator and current shunt
- Second connectors onboard allow daisy chaining
- Screw-clamp terminal blocks permit easy and reliable connections

Introduction

PCLD-789D is a front-end signal conditioning and channel multiplexing daughterboard for use with PC-LabCard™ product's analog input ports. It multiplexes 16 differential input channels into a single A/D converter input channel. You can cascade up to ten PCLD-789Ds, allowing a single data acquisition card to access 160 analog input channels.

PCLD-789D has DB37 and 20-pin flat cable connectors and lets your PCL-818L or PCL-818HD access up to 128 channels without using an additional digital output cable to select channels. The PCLD-789D uses a high-grade instrumentation amplifier that provides switch-selectable gains of 1, 2, 10, 50, 100, 200 and 1,000. This amplifier lets you accurately measure low-level signals with your PC-LabCard™ product. The board also contains a cold-junction sensing circuit that allows direct temperature measurement from thermocouple transducers. A wide variety of thermocouples are supported with software compensation and linearization.

Specifications

I/O

- **Cold-junction Compensation** 24.4 mV/°C, 0 V at 0° C
- **Input Channels** 16 differential
- **Input Conditions**

Gains	CMRR	Nonlinearity	Setting Time
1,000	125 dB	0.005% FSR	75 μ sec.
100	115 dB	0.005% FSR	15 μ sec.
10	105 dB	0.007% FSR	15 μ sec.
1	85 dB	0.015% FSR	15 μ sec.

- **Input Range** ± 10 V max. depending on the selected gain
- **Output Range** ± 10 V max.
- **Overvoltage Protection** ± 30 V continuous

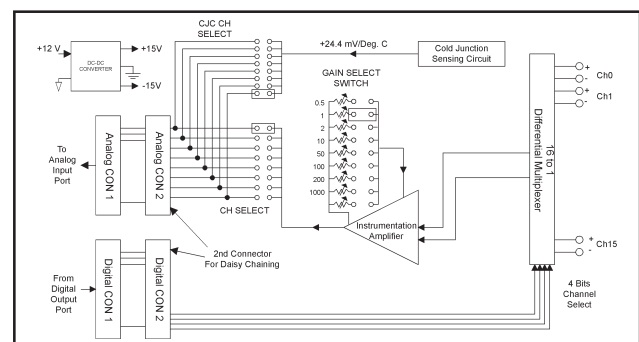
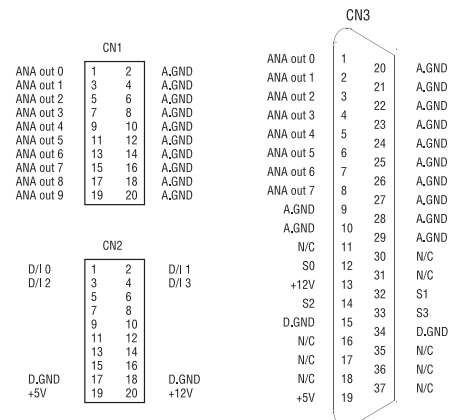
General

- **Certifications** CE
- **Connectors**
Controller: 1 x DB37 male connector
2 x 20-pin box header for daisy chaining
Screw terminals
- **I/O:**
205 x 114 mm (8.1" x 4.5")
- **Dimensions (L x W)** 4 x screw holes for flat surface mounting
- **Mounting**
- **Power Consumption** 5 V @ 30 mA max, 12 V @ 80 mA max.

Ordering Information

- **PCLD-789D** Amplifier and Multiplexer Board w/ 1m DB37 Cable
- **PCL-10137-1** DB37 Cable, 1 m
- **PCL-10137-2** DB37 Cable, 2 m
- **PCL-10137-3** DB37 Cable, 3 m
- **PCL-10120-1** 20-pin Flat Cable, 1 m
- **PCL-10120-2** 20-pin Flat Cable, 2 m

Pin Assignments



Block Diagram

ADAM-3900 Series

DIN-rail Terminal Boards



ADAM-3909

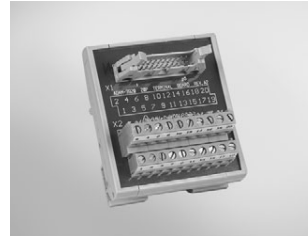
DB9 DIN-rail Wiring Board

Features

- Low cost universal DIN-rail mounting screw terminal module for PC-LabCard™ products with DB9 connector
- Case dimensions (W x L x H): 77.5 x 45 x 51 mm (3.1" x 1.8" x 2.0")

To Be Used With

PCI-1714U/UL, PCL-728, PCL-740, PCL-741, PCL-743B, PCL-745B



ADAM-3920

20-pin DIN-rail Flat Cable Wiring Board

Features

- Low cost universal DIN-rail mounting screw terminal module for PC-LabCard products with 20-pin connector
- Case dimensions (W x L x H): 77.5 x 67.5 x 51 mm (3.1" x 2.7" x 2.0")

To Be Used With

PCI-1735U, PCL-711B, PCL-720+, PCL-726, PCL-727, PCL-730, PCL-812PG, PCL-816, PCL-818 Series, PCL-836



ADAM-3925

DB25 DIN-rail Wiring Board

Features

- Low cost universal DIN-rail mounting screw terminal module for PC-LabCard products with DB25 connector
- Screw-clamp terminal blocks allow easy and reliable connections
- Case dimensions (W x L x H): 77.5 x 56.3 x 51 mm (3.1" x 2.2" x 2.0")

To Be Used With

PCI-1757UP, PCL-833



ADAM-3937

DB37 DIN-rail Wiring Board

Features

- Low cost universal DIN-rail mounting screw terminal module for DAQ cards with DB37 female connector
- Case dimensions (W x L x H): 77.5 x 146.3 x 51 mm (3.1" x 5.8" x 2.0")

To Be Used With

PCI-1713U, PCI-1715U, PCI-1718H DU, PCI-1720U, PCI-1730U, PCI-1733, PCI-1734, PCI-1750, PCI-1760U, PCI-1761



ADAM-3950

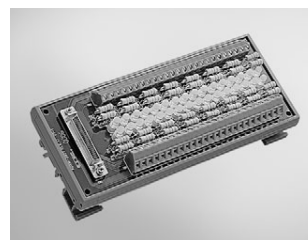
50-pin DIN-rail Flat Cable Wiring Board

Features

- Low cost universal DIN-rail mounting screw terminal module for PC-LabCard™ products with 50-pin flat cable connector
- Case dimensions (W x L x H): 77.5 x 146.3 x 51 mm (3.1" x 5.8" x 2.0")

To Be Used With

USB-4751/L, PCI-1737U, PCI-1739U, PCL-722, PCL-724, PCL-731



ADAM-3951

50-pin DIN-rail Wiring Board w/ LED Indicators

Features

- Low-cost DIN-rail mounting wiring terminal module for PCI-1752/1754/1756 with 50-pin SCSI female connector
- Screw-clamp terminal blocks allow easy and reliable connections
- Each LED indicates its current bi-directional I/O logic status with either green or red light
- Case dimensions (W x L x H): 77.5 x 179.5 x 41.5 mm (3.1" x 7.1" x 1.6")

To Be Used With

PCI-1752U, PCI-1754, PCI-1756

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Operator Panels

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Fanless Panel PCs

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Ethernet Switches

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Serial Comm. Cards

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Video Surveillance

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Pre-Configured Systems

10
IPC Chassis

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SBCs and Backplanes

12
Industrial Motherboards

13
Embedded IPCs

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Mobile Computers

15
IPC Peripherals

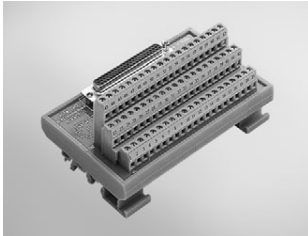
16
DAQ

17
Signal Conditioning

18
USB DAQ

ADAM-3900 Series

DIN-rail Terminal Boards



ADAM-3962

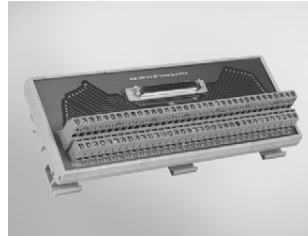
DB62 DIN-rail Wiring Board

Features

- Low cost universal DIN-rail mounting screw terminal module for DAQ cards with DB62 female connector
- Screw-clamp terminal blocks allow easy and reliable connections
- Case dimensions (W x L x H): 77.5 x 124.5 x 63.5 mm (3.1" x 4.9" x 2.5")

To Be Used With

PCI-1762



ADAM-3968

68-pin DIN-rail SCSI Wiring Board

Features

- Low cost universal DIN-rail mounting screw terminal module for industrial applications with 68-pin SCSI female connector
- Case dimensions (W x L x H): 77.5 x 191.2 x 51 mm (3.1" x 8.4" x 2.0")

To Be Used With

PCI-1710U/UL, PCI-1710HGU, PCI-1711U/UL, PCI-1712/L, PCI-1716/L, PCI-1741U, PCI-1742U, PCI-1747U, PCI-1721, PCI-1723, PCI-1751, PCI-1753, PCI-1723, PCI-1780U



ADAM-3968/20

68-pin SCSI to 3 20-pin Box Header Board

Features

- Low cost universal DIN-rail mounting screw terminal module for PC-LabCard™ products with 68-pin SCSI connectors
- Converts one 68-pin SCSI connector to three 20-pin connectors
- Case dimensions (W x L x H): 77.5 x 80 x 54.3 mm (3.1" x 3.2" x 2.1")

To Be Used With

PCI-1751, PCI-1753



ADAM-3968/50

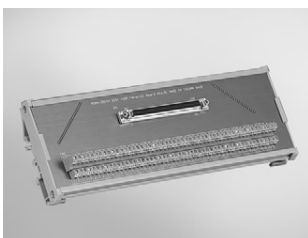
68-pin SCSI to 2 50-pin Box Header Board

Features

- Low cost universal DIN-rail mounting screw terminal module for PC-LabCard™ products with 68-pin SCSI connectors
- Converts one 68-pin SCSI connector to two 50-pin Opto-22 compatible box headers
- Case dimensions (W x L x H): 77.0 x 101.0 x 54.3 mm (3.0" x 4.0" x 2.1")

To Be Used With

PCI-1751, PCI-1753



ADAM-39100

100-pin DIN-rail SCSI Wiring Board

Features

- Low cost universal DIN-rail mounting screw terminal module for industrial applications with 100-pin SCSI female connector
- Case dimensions (W x L x H): 80 x 230 x 42 mm (3.14" x 9.05" x 1.65")

To Be Used With

PCI-1240U, PCI-1755

Cable Accessories



PCL-1010B
BNC to BNC Cable, Male



PCL-10250
100-pin SCSI to Two 50-pin SCSI Cable



PCL-101100
SCSI Cable 100-pin Male 1m w/ Bolt Screw



PCL-10150
50-pin Flat Cable



PCL-10120
20-pin Flat Cable



PCL-10251
100-pin to Two 50-pin SCSI Cable for PCI-1240



PCL-10121
20-pin Shielded Cable



PCL-10125
DB25 Cable



PCL-10268
100-Pin to Two 68-pin SCSI Cable



PCL-10137/H
DB37 Cable



PCL-10168
68-pin SCSI Shielded Cable



PCL-10901
PS/2 to DB9 Cable

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DAQ

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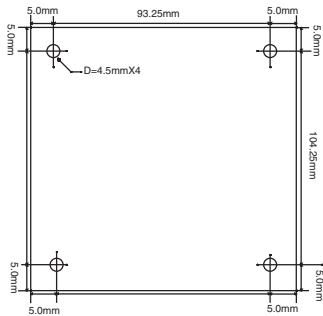
Signal Conditioning

18

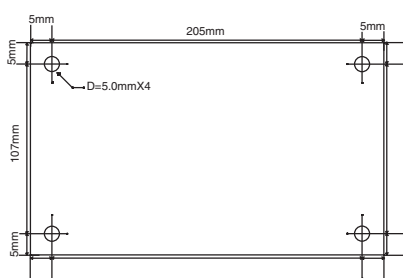
USB DAQ

Terminal Board Dimensions

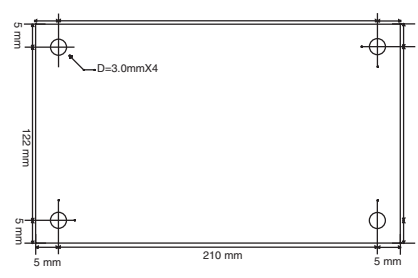
PCLD-780



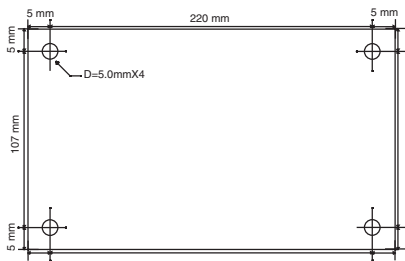
PCLD-782



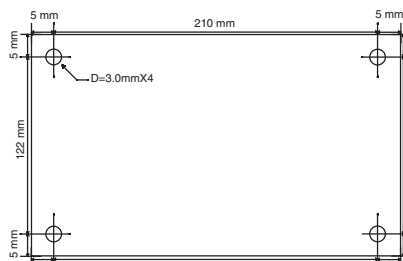
PCLD-782B



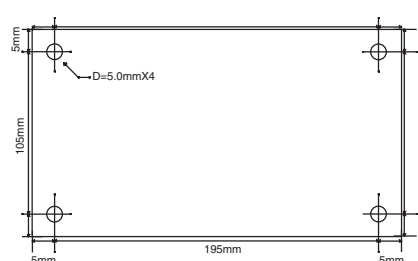
PCLD-785



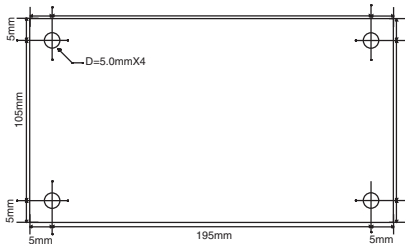
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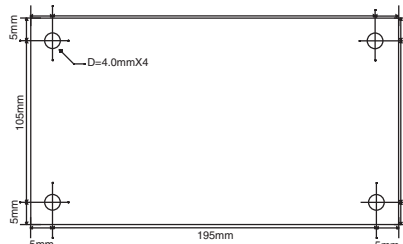
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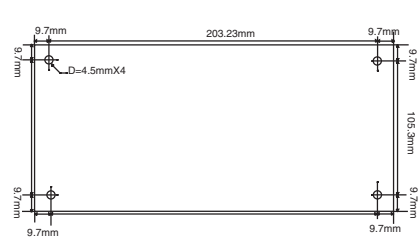
PCLD-788



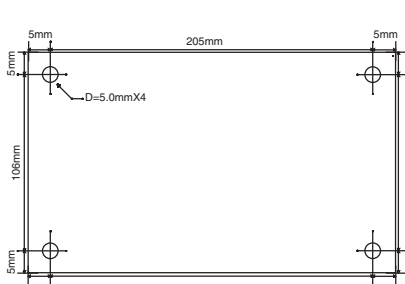
PCLD-789D



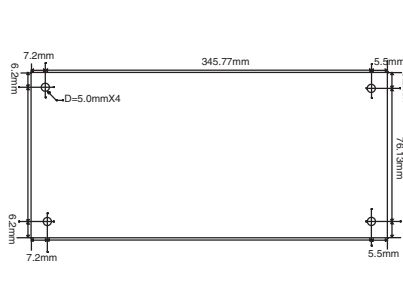
PCLD-880



PCLD-885



PCLD-7216



PCLD-8710

